

# 87C196KD

The 87C196KD is a high performance member of the MCS<sup>®</sup>-96 Microcontroller Family. The 87C196KD is more highly integrated than the 87C196KB or 87C196KC having 32K of on-chip OTP EPROM (one time programmable EPROM), 1000 bytes register RAM, and advanced interrupt handling capabilities. The 87C196KD's register architecture eliminates accumulator bottleneck and enables fast context switching. The 87C196KD has bit, byte, word and some 32-bit operations. The 87C196KD is capable of 16x16 bit multiply in 1.4  $\mu$ S, and 32/16 divide in 2.4  $\mu$ S when operated at 20 MHz.

The 87C196KD has a dynamically reconfigurable 8- or 16-bit external data bus. Automatic insertion of 0, 1, 2 or 3 wait states is possible with no external hardware by using the READY function.

The 87C196KD offers 8 channel, A/D conversion with 8- to 10-bits of resolution, programmable sample and conversion times.

The 87C196KD offers a Peripheral Transaction Server, which is an alternative way to service an interrupt, reducing latency and overhead similar to a DMA. The PTS is capable of handling single and block transfers, A/D conversions, and High Speed Input and Output servicing without executing an interrupt service routine.

Four high speed capture inputs are provided to record times when events occur. Six high speed outputs are available for pulse or waveform generation. The high speed output can also generate four software timers or start an A/D conversion. Events can be based on either of two Timer/Counters.

The 87C196KD has 48 I/O lines, an on-chip serial port, watchdog timer, two 16-bit timers, and three pulse width modulated output signals. Intel's CHMOS\* process provides low power consumption along with high performance. To further reduce power requirements, the processor can be placed into Idle or Powerdown mode.

## Features

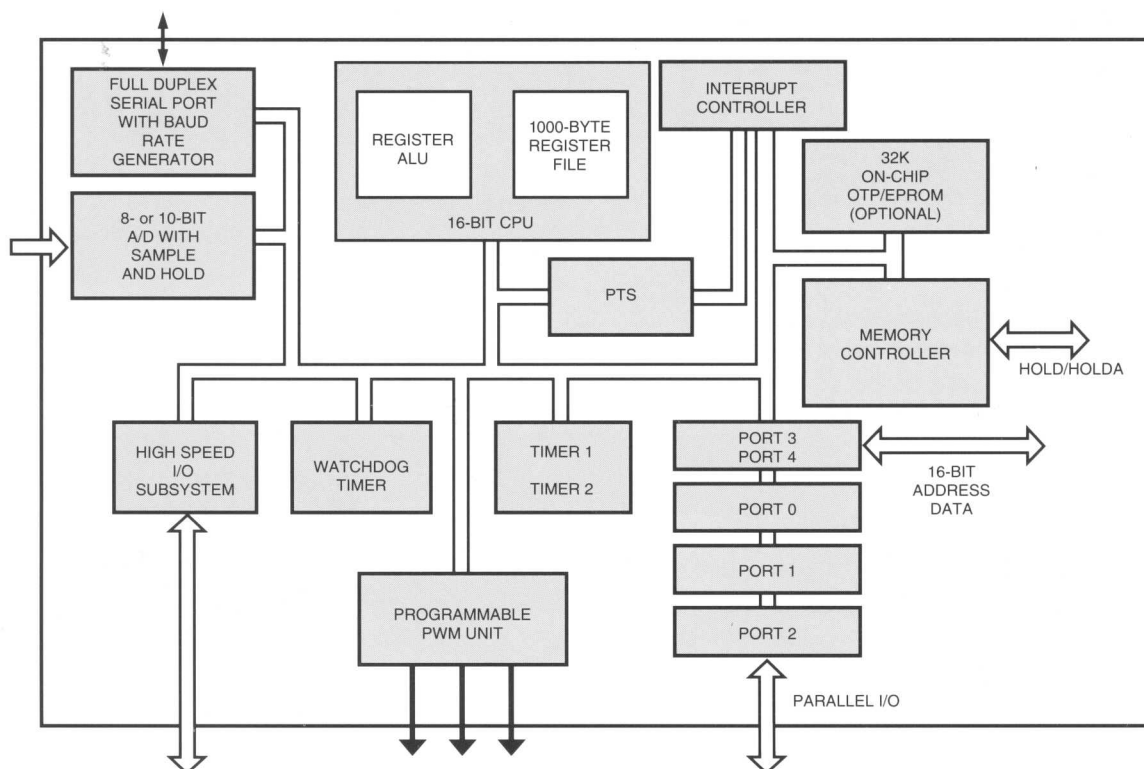
- 16 and 20 MHz available
- Register to Register Architecture
- 1000 Byte Register File
- 1.4  $\mu$ S 16 x 16 multiply (20 MHz)
- 2.4  $\mu$ S 32/16 divide (20 MHz)
- High Speed I/O subsystem
- Peripheral Transaction Server
- 8- or 10-Bit A/D Converter with Sample/Hold
- 8 or 16-Bit External Bus
- Full Duplex Serial Port
- Two 16-Bit Timers
- Three Pulse Width Modulated Outputs

## Benefits

- No accumulator bottleneck
- Fast context switching
- Fast, precise control
- Compact calculation loops
- Accurate timing of multiple events
- Fast Handling of external events-without interrupt service routine overhead
- Reduced board space, accurate feedback
- Optimized memory interface
- Communication with standard devices
- Versatile event tracking
- Reduced processor overhead

*For applications  
sensitive to board  
space constraints,  
Intel's new  
87C196KD offers  
32K on-chip  
memory.*

**intel**<sup>®</sup>



## HIGH PERFORMANCE CPU

## FULL DUPLEX SERIAL PORT

### PERIPHERAL TRANSACTION SERVER (PTS)

## PULSE WIDTH MODULATOR

## 8-CHANNEL HIGH SPEED I/O

\* CHMOS is a patented Intel process.

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